

RESEARCH ARTICLE

Junior parkrun pilot in Australia: A real world evaluation

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Abstract

Issue Addressed: Regular physical activity is important for children's health. Parkrun supports communities to deliver free, weekly, 5 km events in 22 countries around the world and is the largest physical activity model delivered at scale in the world. Junior parkrun aims to encourage children aged 4–14 years to be active outdoors through providing safe, cost-free and non-competitive weekly timed walk, run or jog over a 2-km distance. The aim of this study is to evaluate the junior parkrun pilot in Australia.

Methods: A process evaluation was conducted using routinely collected data of junior parkrun participants, as well as a self-completed questionnaire.

Results: A total of 1827 children had registered and participated in at least one junior parkrun over the course of the pilot period. Participants had, on average, attended 10% of the junior parkrun events including and subsequent to their first participation by the end of the study period. Majority of parents (61%) said that junior parkrun had increased their child's physical activity either a little or a lot, and most agreed or strongly agreed that junior parkrun was fun (90%), enjoyable (91%), energising (85%) and challenging (70%).

Conclusion: The junior parkrun pilot appears to show promise in Australia for enabling children to engage in physical activity, in their local communities in a fun and inclusive way.

So What: Parkrun junior can co-exist with other organised sports programs; however, it can also specifically target those not participating in any sports, given the high levels of enjoyment in a non-competitive, non-team environment.

KEYWORDS

children, community engagement, parkrun, physical activity, pragmatic evaluation

1 | BACKGROUND

Regular physical activity is important for children's health, wellbeing, growth and development.^{1,2} Children who are physically active are at less risk of non-communicable disease, poor mental health and are more likely to learn new skills, have friends and socially connect with their peers.^{3–7} To achieve these health and wellbeing benefits, it is

recommended children participate in 60 min of moderate to vigorous physical activity every day, on average.^{8,9} Research from an Australian school-based population survey of children aged 5–16 years showed that only one in five children (19%) were meeting the daily physical activity recommendations.^{8–10} There has been little progress in improving children's physical activity levels over the recent decades.^{10,11} Development and evaluation of interventions to

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promote physical activity among children remains a priority. Sports and physical activity have been strongly advocated for as one way to increase children's daily physical activity levels.¹² There is evidence demonstrating a range of physical, psychological, academic and social health benefits for children who participate in sports and physical activity.¹²⁻¹⁴ Access to opportunities, and the costs associated with community-based sports and physical activity mean that children may not be able to participate in sports and physical activities they would like to.¹⁵⁻¹⁹

A global review of participation in sports and leisure time activities identified running as a popular leisure time physical activity globally among children.²⁰ Children's participation in walking and running is often unstructured free-play or transport related.²⁰ Running is also fundamental for many popular children's sports activities too, and contributes towards meeting physical activity recommendations. Creating more opportunities for children to participate in community-based running and walking may lead to improvements in physical activity levels. There is limited evidence on the effect of community-based running or walking interventions on children's physical activity levels.²¹

Parkrun supports communities to deliver free, weekly, 5-km events in 22 countries around the world and is the largest physical activity model delivered at scale in the world.²² Junior parkrun is an adapted version of parkrun designed specifically for children and their families. Junior parkrun aims to encourage children aged 4-14 years to be active outdoors and spend time with friends and family through providing safe, cost-free and non-competitive weekly timed walk, run or jog over a 2-km distance. In 2017, parkrun Australia officially announced a 12-month pilot of junior parkrun in three locations with the first junior parkrun event in Australia held in April 2018. Junior parkrun first launched in 2010 in UK with nine children.²³ It is now well established in the UK and Ireland, with 385 locations, over 400 000 children participating in over 4 million runs.²⁴ However, no evaluations of the reach and impact of junior parkrun have been published in the peer review literature.

This paper presents the results of a process evaluation of the junior parkrun pilot across three sites in Australia. The primary purpose is to understand the reach of junior parkrun by reporting on the demographic characteristics and attendance rates of those who participate in junior parkrun. Secondary aims include the children's self-reported experience of participating in junior parkrun, the degree and nature of their engagement with others at parkrun and motivations for, and barriers participation to junior parkrun.

2 | METHODS

2.1 | Registration and participation at parkrun

Parkrun asks all individuals who participate in parkrun events to register online before participating. The registration collects details regarding their date of birth, sex, postcode and current physical activity level. Once individuals complete the registration process, they receive

a barcode (containing a unique athlete ID), which they print and bring to each parkrun event. Anyone aged 4 years or more can register and receive their individual barcode for participation in parkrun events. Children under 11 years old should be accompanied at parkrun events. When an individual participates in a parkrun event and scans their barcode at the end of the event, their individual barcode is used to record their participation data (event location, event date and time they took to complete the run) and links to their registration information. Participation data are emailed to participants, recorded by parkrun, and published online.

2.2 | Study population

Three junior parkrun events were piloted in Australia during 2018/2019 (Cannonvale [Queensland], Southport [Queensland] and Westerfolds [Victoria]). The three locations differed in terms of start date (Southport, 22 April; Westerfolds, 27 May; Cannonvale, 10 June). All children (4-14 years old) who had registered to participate with parkrun and participated in at least one junior parkrun event during the first 52 events held at each location (the pilot period) were eligible to participate in the study.

2.3 | Recruitment and data collection

All participants from each junior parkrun event location were invited to participate in this study via email, to the email address provided at the time of registration, after the 26th and 52nd junior parkrun event held at that location (i.e., approximately 6 months or 12 months into the pilot period). Both email invitations were valid for 3 weeks, with a reminder email sent 2 weeks after the initial invitation to all who had not responded. Invitations to complete the second survey were emailed after the 52nd event only to junior parkrun participants who registered after the week 26 survey administration.

Data used in this study were obtained via three sources: (i) routinely collected data from parkrun databases, (ii) junior parkrun website results and (iii) an online survey.

1. Routinely collected parkrun data from survey participants: parkrun provided anonymised run participation history data for all junior parkrun runners who consented to participate in this study. Athlete ID, parkrun participation including event date, distance run (5 km or 2 km), event name, club, event country, run time, the cumulative number of parkrun events participated in and the participant's age category. Identifiable information was removed.
2. Junior parkrun website data: parkrun displays details of participants on their website after each event. Website data were extracted from each junior parkrun event during the study period to provide characteristics of all junior parkrun participants. This includes: junior parkrun event number, date of the event, athlete name, age category, sex, club, best-ever time and run time at the event.

3. Online survey: The online survey was completed by the adult caregiver on behalf of the child. Survey instructions recommended that the survey be completed with the child present to increase the validity of responses. The survey was completed during the online recruitment process. The survey asked questions about the participant's demographic characteristics (date of birth, sex, post-code, primary language spoken at home, chronic medical conditions). Twelve common ongoing health conditions were listed, along with the option of specifying 'other' conditions. This was classified as 'Yes' if the participant indicated the child had any ongoing health condition, or 'No' if they had none. Validated survey items were used where possible to assess physical activity levels of the adult and the child, the child's sports and community participation,^{25,26} annual expenditure on sports²⁶ and social influences on the child's participation. A dichotomous indicator as to whether participants had met recommended levels of physical activity over the previous last 7 days was generated for both the child and the adult completing the survey on behalf of the child was generated.

Bespoke survey items also assessed the perceived influence of parkrun on the child's physical activity and their experiences and social interactions at parkrun events.

A question asking whether the adult felt that the child's physical activity level had been influenced by parkrun junior (response options: decreased a lot, decreased a little, no change, increased a little, increased a lot) was dichotomised to decreased or no change (reference category) and increased a little/a lot for analysis to reflect whether physical activity had increased and because of small cell sizes.

A five-item question (fun, enjoyable, physically challenging, depressing and energising) was developed to elicit the experience of participating in junior parkrun assessed on a five-point Likert scale (ranging from 'disagree a lot' to 'agree a lot'). A one-item question regarding how easy it was to motivate the child to participate in parkrun was developed, with assessment reported on a five-point Likert scale (ranging from 'very easy' to 'very difficulty').

Socio-economic status (SES) was defined using participant's post-code and Australian Bureau of Statistics' Socio-Economic Indexes for Areas (SEIFA) Index of Relative Disadvantage²⁷ to classify area-level SES into quintiles—the lowest two quintiles (1 and 2) were classified as low SES and the quintiles 3–5 as high SES.

2.4 | Analysis

Survey responses were downloaded from Qualtrics and cleaned in Microsoft Excel and STATA. Parkrun registration and run history data and survey data were merged using the participant's unique parkrun ID.

Descriptive statistics for participant demographic characteristics and physical activity behaviours (child and adult) were generated from website (all children) and survey participants, and distributions of self-

reported perceived impact of junior parkrun (happiness, mental health, energy levels and enjoyment of physical activity), child motivations for attending junior parkrun and who the child interacts with at junior parkrun.

To examine whether there were any difference in rates of participation by demographic characteristics, a series of bivariate Poisson regression models were run for participation in parkrun junior rate over gender, age, SES and annual spend on sports. Results are expressed as incidence rate ratios (IRR) with 95% confidence intervals.

Impact of participation in junior parkrun on physical activity was examined first by regressing a dichotomous variable of whether the parent felt that their child's physical activity had increased (vs. decreased/no change) on participation rate using generalised linear regressions with a binomial distribution and a log link. Covariates included gender and age and results are reported as adjusted prevalence ratios (APR) with 95% confidence intervals. Second, we examined the change in finishing time from the child's first participation occasion to their best finishing time (in seconds) per junior parkrun attended after a minimum four previous participation occasions, adjusted for age, gender and initial finish time. The minimum threshold was set at >4 runs as this was the median number of runs in the study period and to allow for the accumulation of the effect of repeated participation. Linear regression models were used as differences in finishing times were normally distributed and unbounded and results are expressed as change in finishing time for a one unit increase in attendance occasions.

The total number of junior parkruns participated in for each individual was summed from their first junior parkrun (Australia) until the date they completed the online survey (henceforth called 'the study period'). If a participant had participated in more than one of the junior parkrun events, their 'home' junior parkrun in Australia was designated as the one that they had participated in most often. Any parkruns completed following the survey date were excluded from the total.

A 'participation ratio' was calculated as the ratio between the number of junior parkruns completed by the individual child divided by the number of weeks a junior parkrun was available for that child's home parkrun. The approach took account of the fact that (1) participants started junior parkrun on different dates, (2) participants completed the survey at different time points following their first run, (3) the junior parkrun events did not all start on the same date and (4) not all of the junior parkruns had an event every week (up to the 20 October 2019 when the data were harvested, Cannonvale had had 46 runs, Southport 67 and Westerfolds 63).

Rates were also calculated separately for the number of 5-km (un-adapted) parkruns the child participated in during the study period and prior to joining junior parkrun (Australia). The rate of 5-km events completed in the study period was the total number divided by the number of weeks between the participant's first junior parkrun and their survey date. Similarly, the rate for the period prior to their first junior parkrun was the total number of 5-km events divided by the number of weeks between their first 5-km run and their first junior

TABLE 1 Junior parkrun participant details from analysis of website data.

	Overall	Cannonvale (48 runs in pilot period)	Southport (52 runs in pilot period)	Westerfold (52 runs in pilot period)
Number of runners	1827	143 (139 as 'home')	861 (855 as 'home')	835 (833 as 'home')
Number of runs, median (range)	2 (1–48)	3 (1–41)	2 (1–48)	2 (1–43)
Female participants, <i>n</i> (%)	842 (46.1)	58 (41.7)	392 (45.8)	392 (46.1)
Age group, <i>n</i> (%)				
4–10 years	1570 (85.9)	126 (90.6)	699 (81.8)	745 (89.4)
11–16 years	257 (14.1)	13 (9.4)	156 (18.2)	88 (10.6)
Participation ratio median (IQR)	.10 (.04–.24)	.13 (.04–.28)	.10 (.04–.25)	.10 (.05–.22)
Average time, mean (SD)	13.13 min (3.79)	12.59 min (3.13)	12.68 min (3.55)	13.68 min (4.03)

parkrun in Australia (nb. 38 participants had not participated in a 5-km parkrun prior their first event). All analyses used a 5% threshold for statistical significance.

2.5 | Ethics approval

This study was approved by the University of Sydney Human Research Ethics Committee (2018/659) and the global parkrun Research Board, along with support from parkrun au and parkrun global teams.

3 | RESULTS

3.1 | Junior parkrun website data

3.1.1 | Overall participation

A total of 1827 children had registered and participated in at least one junior parkrun over the course of the pilot period; 12 of these runners participated in parkrun at two pilot sites. Of all registered runners, 622 participated in only one event, with one runner participating in a total of 48 runs of the 52-week pilot period. The median number of runs during the pilot was two. Of the 1827 registered runners, 46.1% of them were female. Across all three sites, there were slightly less females participating each week, with averages of 45% female participation at both Southport and Cannonvale, and 43% female participation at Westerfolds. The majority of runners (85.9%) fell into the 4–10-year-old category, with the remaining 14.1% aged 11–14 years (Table 1).

Southport had a total of 861 runners participating over the 52 runs, ranging from 289 (33.5%) runners participating in one run, to one runner participating in 48 runs. Westerfolds had a total of 835 (36.8%) runners participating over the course of 52 runs, with 308 runners participating in one run, and one runner participating in 43 runs. Cannonvale had a total of 143 runners participating over the

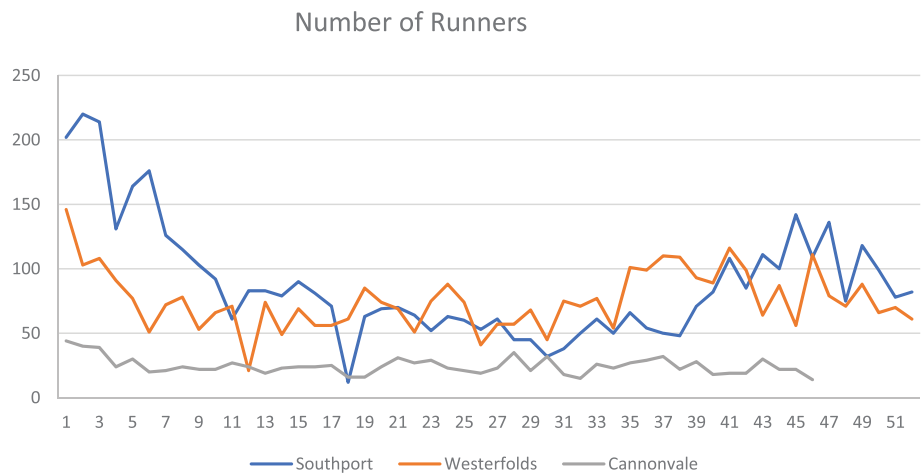
48 runs, ranging from 38 (25.8%) runners completing only one run to one runner completing 41 runs.

3.1.2 | Participation numbers over time

All three sites had their greatest participant numbers in the first three runs held, with numbers reducing from run four onwards. Two sites (Southport and Westerfolds) started with quite strong numbers of participants, with Southport having its highest number of participants of 220 at their second run (with 202 at their first run and 214 at their third run). Southport continued to see a reduction in numbers until about run 30 (with 32 runners in attendance), after which participation picked up slightly and we start to see a potential plateau around Week 41, with numbers hovering around 100. Westerfolds started the pilot period with their greatest number of runners ($n = 149$); however, participation began to drop over the first 9 weeks to a low of 53 runners. Westerfolds seems to have reached a plateau around this point (of around 60 runners), with a potential slight increase around event 35 resulting in around 80 runners participating for the final weeks of the pilot period. Cannonvale started with substantially lower numbers compared to the other two sites. Although it also experienced an initial drop from its high of 44 runners at its first run, it had a fairly consistent number of runners each week hovering around 25 runners (Figure 1).

The median rate of participation in junior parkrun, between their first junior parkrun and the end of the pilot period was .10 (IQR: .04–.24), meaning participants had, on average, attended 10% of the junior parkrun events including and subsequent to their first participation by the end of the study period. This participation rate varied slightly by site, with a participation rate of .13 at Cannonvale, and .10 at both Southport and Westerfold. Median participation rate did not vary by gender (females .10, IQR: .04–.24; Males .10, IQR: .04–.25); however, it did vary slightly by age would, with the younger age groups having a slightly higher participation ratio (4–10 year olds: .10, IQR: .04–.25; 11–14 year olds: .08, IQR: .04–.14).

FIGURE 1 Number of runners in three junior parkrun sites over time.



3.1.3 | Run times

The mean run time overall was 13.13 min, with little difference between locations. There was however a significant difference in the mean run times between males and females (12.5 min vs. 13.8 min, $t = 6.87$, $p < .001$) and age groups (4–10 year olds: 13.5 min, 11+ years: 11.0 min, $p < .001$). In runners who attended more than one run, there was a significant decrease in run time over the pilot period ($p < .001$), this decrease would not be considered a meaningful difference, with run times decreasing an average of .5 s for each subsequent event (95% CI: .3–.7 s).

3.2 | Survey response rates

Invitations to participate in the first survey were emailed to junior parkrunners ($n = 721$) who had participated in at least one event up until the 26th event, of which 68 responded (9.4% response rate). Invitations to complete the second survey were emailed junior parkrunners ($n = 666$), who registered after the Week 26 survey administration, and had participated in at least one junior parkrun event up until the 52nd event, of which 57 completed (8.6% response rate). There were six survey participants who completed both the first and second surveys. Therefore, only the first survey of these participants were included.

This analysis is based on surveys of 125 children (by-proxy) where 55% of surveys were completed with the child present. We did not have access to demographic details or attendance records of junior parkrun participants who declined to participate in the online survey, nor do we have reasons for non-participation. To determine whether individuals who completed the first or second survey differed, the two samples were compared in terms of gender and found to be comparable (44.1% vs. 43.8%, respectively, $p = .977$); age (7.7 years vs. 7.8 years, $p = .851$), total number of participation occasions (6.6 vs. 7.9, $p = .430$), junior parkrun participation rate (.36 vs. .31, $p = .338$). The analyses for these two groups were pooled.

TABLE 2 Demographic characteristics of survey participants (junior parkrunners).

		All ($n = 125$)
Sex	Male	55 (44.0%)
	Female	70 (56.0%)
Age	4–7 years	52 (41.6%)
	8–9 years	37 (29.6%)
	10–14 years	32 (25.6%)
	Missing	4 (3.2%)
Socio-economic status quintiles (SES)	Low SES (1, 2)	18 (14.4%)
	High SES (3–5)	103 (85.6%)
Primary language spoken at home	English	120 (96.0%)
	Other	5 (4.0%)
Ongoing health conditions	No	104 (83.2%)
	Yes	21 (16.8%)

3.3 | Survey participant demographic characteristics

Children had a mean age of 8.0 years old (SD: 2.5) and 56% were female. The majority lived in high socio-economic areas, spoke English at home and did not report having ongoing health conditions (Table 2).

3.4 | Junior parkrunners' physical activity

Table 3 presents data on the number of days each week children meet physical activity recommendations (60 min of physical activity). The median number of days achieving 60 min of physical activity were 6 days per week (range 1–7), with 29.1% meeting guidelines for physical activity for children (60 min every day). When asked about their participation in sports, 53% reported participating in team sports

TABLE 3 Junior parkrunners' physical activity and health conditions.

		All (n = 125)
Number of days achieving 60 min of physical activity (children)	0-2	8 (6%)
	3	15 (13%)
	4	14 (12%)
	5	21 (18%)
	6	25 (21%)
	7	34 (29%)
Participation in team sports	Yes	66 (53%)
	No	59 (47%)
Participation in Individual sports	Yes	89 (71%)
	No	36 (29%)
Participation in team or individual sports	Both team and individual sports	46 (36%)
	Team sports only	20 (16%)
	Individual sports only	43 (34%)
	Neither team nor individual sports	16 (13%)
Ongoing health conditions	No	104 (83.2%)
	Yes	21 (16.8%)

(e.g., Soccer, Netball, Cricket) and 71% of children participated in an individual sports (e.g., swimming, tennis, karate or gymnastics). Over one-third (36%) of children who participated in sports participated in both individual and team sports during the past 12 months. Thirteen percent of junior parkrun participants reported participating in neither individual or team sports. The median number of sessions of structured physical activities were 48 sessions and 52 sessions in team and individual activities, respectively, in the past 12 months. Through these sessions' children accumulate 2.7 h or 160 min of physical activity though sports on average per week.

3.5 | Junior parkrun participation of survey participants

The median number of junior parkruns completed by study child participants was 4 (range 1-49). During the study period, junior parkrun participants attended a median of two 5-km parkruns (range 0-50), in addition to their junior parkrun participation. One in three (n = 38/125) had not participated in parkrun (5 km) before starting to participate in junior parkrun. The median rate of participation in junior parkrun, between their first junior parkrun and the end of the study period was .23 (range: .02-1.0), meaning respondents had, on average, attended just under one-quarter of the junior parkrun events including and subsequent to their first participation by the end of the

TABLE 4 Median participation rate over demographic characteristics and annual spend on sports (n = 125).

Characteristic	Median participation rate ^a	p-value
All	.23	NA
Gender		
Girls	.26	.798
Boys	.22	
Age		
4-7 years	.26	.726
8-9 years	.22	
10-14 years	.22	
Socio-economic status (SES) quintiles		
1-2 (low SES)	.22	.401
3-5 (high SES)	.38	
Sports spend		
\$0-\$600	.19	.599
\$601-\$1200	.21	
\$1201+	.29	

^aParticipation rate calculated as number of participation occasions over the number of events possible between first participation occasion and end of study period. Expressed as a probability of participating per event.

study period. Seven junior parkrun participants attended more than one junior parkrun location in Australia or the UK.

3.6 | Junior parkrun participation and demographic profile of survey participants

To examine whether junior parkrun participation rates differed across subpopulations, we compared rates over demographic characteristics and annual spend on sports (Table 4). Although the median participation rates varied across different subpopulations, none reached statistical significance.

3.7 | Junior parkrun participation and impact of physical activity

When asked about the influence of junior parkrun on the child's total physical activity, 61.2% said that junior parkrun had increased their child's physical activity either a little or a lot, only one participant (1%) indicated that their physical activity had decreased a little. Although the participation rate was higher for those who reported that junior parkrun had increased the child's physical activity a little or a lot (participated in 35% and 38% of events, respectively) than those who reported no change (participated in 30% of events), the regression

analysis showed the association was not significant adjusted for the child's gender and age (APR = 1.27 [95% CI: .84–1.90]). There was, however, a significant impact of total number of runs in the study period on change in finishing time from first to best run (only for those who had accumulated greater than four runs, $n = 58$). Adjusted for age, gender and first junior parkrun finishing time, participants reduced their finishing time on average by .08 min (95% CI: $-.12$ to $-.03$) or 4.58 s with each additional participation occasion.

3.8 | Children's social interaction

Many children interacted with other members of the junior parkrun community outside of their family network. These interactions included other junior parkrunners, some who they knew before participating (42%), and others who they had met at parkrun (30%), as well as junior parkrun volunteers (40%) and spectators (10%).

3.9 | Children's subjective experience of junior parkrun

Most participants indicated they agreed or strongly agreed that junior parkrun was fun (90%), enjoyable (91%), energising (85%) and challenging (70%) (Appendix S1).

4 | DISCUSSION

Lack of evaluations into community-based physical activity programs hampers conclusions and learning regarding effective interventions for increasing children's physical activity.²⁸ This paper summarises the findings of a process evaluation of the junior parkrun pilot in Australia. The primary purpose of this study was to understand the reach of junior parkrun in terms of demographic characteristics and the physical activity status of those who participate in junior parkrun and undertook an online survey. This is the first study to examine junior parkrun participants' physical activity levels, beyond their finish times in junior parkrun events, and contributes to existing evidence on the impact of community-based interventions on children's physical activity.^{21,29}

Junior parkrun AU appears to offer a gender-inclusive environment, attracting both boys and girls. Data from the Australian sports sector Ausplay survey shows differences in sports participation by gender, with boys participating more often than girls and girls often choosing more non-sport related organised activities outside of school than their male counterparts.²⁶ As inclusivity is inherent in parkrun globally, this could be a design strategy for other future interventions focused on engaging children and families.

Despite most children who completed the survey reporting regular participation in organised team and individual sports in the previous 12 months, just 29% of children reported achieving 60 min of physical activity each day in a typical week. This proportion of

children meeting physical activity guidelines is slightly higher than the population, with estimates indicating only one in five children (19%) were meeting the daily physical activity recommendations.³ This may indicate that those in the study are less likely to participate in unstructured physical activity, and place a higher value in organised activities compared to the Australian population.

Participants reported positive influences of junior parkrun on children's physical activity, and most participants agreed that junior parkrun was fun, enjoyable, energising and challenging for the child. A continued focus on the fun elements of junior parkrun appears critical in sustaining children's engagement with junior parkrun given that fun and enjoyment are strong motivators for participation in this age group.^{20,30}

While considering equity, the three junior parkrun pilot events were established in high socio-economic areas, and survey participant characteristics reflect this. Children in this study were predominantly English speakers, with 82% coming from advantaged communities, which is considerably different to the general Australian population, with 79% of the population speaking English at home³¹ and 20% of children living in the highest socio-economic areas.³² More than 30% of children had not participated in the 5-km parkrun events before their junior parkrun participation, which suggests the modified 2-km version of parkrun is engaging a new audience more suited to children.

Parkrun's ability to reach a range of people across the population including those who are often underrepresented in organised sports has been demonstrated,³³ although we were unable to demonstrate such a reach with the pilot of parkrun junior. With most participants in the survey having participated in other organised sports within the past 12 months, and the high SES of the locations in which the pilot sites were established, it is important to consider whether children most in need of access to a free, weekly sporting event were exposed to the event.

Although not measured explicitly in this evaluation, it is worth considering expanding parkrun junior to be more inclusive of children with a disability and other special needs. The slow growth, acceptance and inclusion of children with special sporting needs in mainstream, weekly sporting competitions and communities is of concern,³⁴ and parkrun junior may be a suitable sporting activity to encourage and promote integration and acceptance into mainstream sport.

The pilot of junior parkrun could be expanded to focus on engaging diverse communities across the spectrum of geographical areas, specifically targeting low-income families.^{35,36} For this to occur, additional community capacity work might be necessary to gain in-depth understanding of the barriers and facilitators for engaging the local communities, who are least likely to be physically active in the disadvantaged areas, to participate.

Although participants in the survey viewed the parkrun junior as a positive experience overall, it is important to note the rapid decline in participation after the first few months of the pilot, with an overall participation rate of around 10% over the course of the year. Given the barriers noted among adult populations of parkrun registrants and attendees,³⁷ these are also likely to carry into attendance patterns of

children in combination with the challenges felt by the children themselves. Whilst the event has the potential to have a positive impact on the health and well being of children taking part, more work may need to be conducted in maintaining participation levels across participants to ensure ongoing benefit from such an event.

4.1 | Strengths and limitations

This paper is the first to evaluate the demographic distribution and other physical activity levels of child participants in junior parkrun. The survey collected information about the child by-proxy (parent report), in some cases with the child present. This method of data collection from participants in different states of Australia provides the best available data on participant's physical activity behaviours and experiences at parkrun. While some survey questions were validated, others were developed specifically for this study and have not been tested for reliability or validity. Survey responses are also prone to social desirability bias. Given the low response rate to the survey, the survey results are not representative of all participants in the junior parkrun pilot in Australia. Compared to all participants registered for junior parkrun, those who completed the survey were more likely to be female (56% vs. 46%, $p = .030$), and have participated in more junior parkrun events (median participation ratio .23 vs. .10, $p < .001$). Given those who completed the survey were more likely to participate, it is likely that the survey results are more positive about the parkrun experience compared to those who did not complete the survey. However, the sample included people with a range of participation frequencies and event exposure. Additional contextual information from those delivering the events in local communities would help inform logistical and feasibility questions regarding the implementation of junior parkrun in Australian communities.

4.2 | Implications of this study

Our analysis has implications not only for parkrun junior as it is operationalised in Australia but also for physical activity interventions more broadly. First, the flexibility of the parkrun model demonstrates that it can co-exist with other organised sport participation. However, our analysis also suggests that initiatives that aim for inclusion such as parkrun could specifically target those who are not participating in any sports in promotions. This may not only improve individual adherence as children are not drawn away into competing activities, but also reach. Second, our results on the children's levels of social interaction in combination with high reported enjoyment of the event may point to the importance of providing opportunities for children to socialise through sport without interpersonal constraints around performance in team sports.³⁸ Finally, our evaluation although attracting only a small response rate for the survey had the advantage of good quality and granular participation data for direct analysis and contextual framing. Collecting and allowing access to administrative data is

key to supporting efforts to learn from real world and scaled-up health initiatives.

5 | CONCLUSIONS

Most children globally and in Australia do not meet current physical activity guidelines. This process evaluation on the junior parkrun AU pilot appears to show promise in Australia for enabling children to engage in physical activity, in their local communities in a fun and inclusive way. It is recommended that additional events are established, with a particular focus on inclusivity, particularly in areas where there is the greatest need, and therefore the potential for greatest improvements.

AUTHOR CONTRIBUTIONS

Erin Mathieu participated in the design of the study, assisted with the data analysis and interpretation of results and drafted the manuscript. Anne C. Grunseit participated in the design of the study, performed the statistical analysis and interpretation of the data. Bridget C. Foley participated in the design of the study and was responsible for the coordination of the study and data collection. Lindsey J Reece conceived of the study and participated in its design and coordination. All authors revised the manuscript for important intellectual content and read and approved the final manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

This study was approved by the University of Sydney Human Research Ethics Committee (2018/659) and the global parkrun Research Board, along with support from parkrun au and parkrun global teams.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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